Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:
NEPR Benthic Habitat Map 2015

1.2. Summary description of the data:
This benthic habitat map was created from a semi-automated habitat mapping process, using a combination of bathymetry, satellite imagery, aerial imagery and underwater videos to classify the 0-35m deep benthic habitats of the region around Northeast Puerto Rico (NEPR) and Culebra Island, including the shallow part of the Northeast Ecological Reserves, Puerto Rico. The area of interest includes the nearshore waters of Fajardo and Luqillo to the Former Roosevelt Roads Navy Base, the Vieques Sound, La Cordillera Reserve, the Luis Pena Reserve, and the waters around Culebra Island. The benthic habitat map is classified based: on 1) geomorphological structure, 2) hard bottom cover, 3) topographic complexity, 4) dominant biological cover, 5) live coral cover and 6) dominant type of coral cover. Underwater photo and video data was collected to provide ground validation for remote sensing imagery, and to assess the accuracy t of the final map. Habitat features are described by varying levels of detail (i.e. , major and minor categories nested within them), so users can depict the habitat information that best suits their research or management needs.

1.3. Is this a one-time data collection, or an ongoing series of measurements?
One-time data collection

1.4. Actual or planned temporal coverage of the data:
2013-02 to 2015-02

1.5. Actual or planned geographic coverage of the data:
W: -65.759998, E: -65.168596, N: 18.446613, S: 18.196796

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
vector digital data

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy,

research vessel, autonomous underwater vehicle, animal tagging, manual surveys,
enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
NCCOS Scientific Data Coordinator

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:
National Centers for Coastal Ocean Science

2.4. E-mail address:
NCCOS.data@noaa.gov

2.5. Phone number:

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
NCCOS Scientific Data Coordinator

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality
NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible
(describe or provide URL of description):

Process Steps:

- 2013-05-01 00:00:00 - A multiresolution bathymetry model was created for northeast Puerto Rico and Culebra Island. The model was derived using geostatistical modeling of depth sounding data from 1900-2013, including led soundings, single-beam sonar, multibeam sonar surveys and LiDAR surveys. The source depth layers were kriged into multiple resolutions (4m, 20m and 100m depending on source data density) and merged using Global Mapper, Surfer and ArcGIS to produce a continuous 4m surface. | Source Produced: NEPR Bathymetry Model (Citation: NEPR Bathymetry Model)

- 2015-02-01 00:00:00 - The geostatistical bathymetry model was processed into derived morphometric layers using Raster Calculator and Jenness Surface Tools in ArcGIS. The slope, slope of slope, rugosity, curvature profile, curvature plan, standard deviation, and mean were derived from the bathymetry model and analyzed for its three first principle components in ENVI. The PCA image was then saved as a 3 band raster (Geotiff). The PCA 3 band image was included as a layer to the semi-automated feature extraction and classification process that produced the benthic habitat map. | Source Produced: NEPR Principle Component Analysis (Citation: NEPR Bathymetry Model)

- 2013-06-01 00:00:00 - An enhanced satellite imagery mosaic was geNEPRated from the mosaic of high resolution WorldView-2 satellite data. Cloud and land cover were masked and the near infrared1 band were used to deglint the RGB bands in the imagery. The Lyzenga method was then used to water-column correct the enhanced RGB bands to better represents underwater benthic habitats. The final mosaic color-balanced using 12 individual scenes divided into 27 sub-scenes using a neighborhood analysis in PCI. The final mosaic was included as a layer to the semi-automated feature extraction and classification process that produced the benthic habitat map. | Source Produced: WV2 Satellite Imagery Mosaic (Citation: WV2 Satellite Imagery Mosaic)

- 2013-01-01 00:00:00 - The Ground validation sites were planned by manually placing points on a draft habitat map. The sites were selected to include all types of remote sensing signatures that could be identified, covering habitat features across the whole project area (approximately two GV sites/km2). Each ground validation site was sampled either by an underwater drop-camera (SeaViewer Sea-Drop 950 and a GoProHero 3 Black Edition) or by snorkeling to the site with handheld underwater video camera (GoProHero 3 Black Edition, 1440*1920 pixels video, 12 MP photo/5s). Drop Camera Videos were positioned and recorded using a Trimble Geo XH GPS system, while snorkel videos were positioned using a handheld Garmin GPS on a dive buoy. The video data was then used to extract habitat data used to classify the habitat map, as well as presence of selected key species such as ESA listed Acropora palmata and Acropora cervicornis corals. | Source Produced: NEPR

Ground Validation Videos (Citation: NEPR Ground Validation Videos)
- 2014-01-01 00:00:00 - Accuracy Assessment points for the NEPR were selected using a stratified random sampling method based on the benthic habitat map schema. Each accuracy assessment site was entered into a Garmin GPS navigation, located by the Biogeography Team in the field, and sampled either by an underwater drop-camera or by snorkeling to the site with handheld underwater video camera. Videos were analyzed by the Biogeography Team and recorded into a database using a Trimble Geo XH system. The video data was then used to accuracy assess the Benthic Habitat map. Presence of selected key species such as ESA listed Acropora palmata and Acropora cervicornis corals were also recorded. | Source Produced: NEPR Accuracy Assessment Videos (Citation: NEPR Accuracy Assessment Videos)
- 2013-02-01 00:00:00 - The 2015 benthic habitat map for Northeast Puerto Rico and Culebra Island, covers 711 km2 of Benthic Habitats with a minimum mapping unit of 100m2. The map was digitized using semi-automated feature extraction techniques and remote sensing imagery (a bathymetry model [1900-2013], WorldView-2 satellite imagery [2011-2013], and Aerial Imagery [2007, 2010]). Ground Validation Videos were collected and classified based on a habitat classification scheme to verify the habitat features segmented using remote sensing imagery. The map was classified using Boosted Regression Tree modelling, using the remote sensing data, the GV data and a suite of spatial predictors including data extracted from the CariCOOS nearshore oceanographic model. The model map was manually edited and adjusted based on visual interpretation. The final map product was adjusted based on the result from a separate accuracy assessment field data collection. | Source Produced: NEPR Benthic Habitat Map (Citation: NEPR Benthic Habitat Map)

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation
The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?
No

6.1.1. If metadata are non-existent or non-compliant, please explain:
Missing/invalid information:
- 1.7. Data collection method(s)

- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.3. Data access methods or services offered
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

https://inport.nmfs.noaa.gov/inport/item/38775

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NMFS Data Documentation Procedural Directive: http://www.nmfs.noaa.gov/op/pds/documents/04/111/04-111-01.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
National Centers for Coastal Ocean Science

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

7.3. Data access methods or services offered:

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection
The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
National Centers for Coastal Ocean Science - Silver Spring, MD

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

9. Additional Line Office or Staff Office Questions
Line and Staff Offices may extend this template by inserting additional questions in this section.